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(पहला पुनरीक्षण)

Indian Standard

AGRICULTURAL MACHINERY — ENDLESS VARIABLE-SPEED V-BELTS AND GROOVE SECTIONS OF CORRESPONDING PULLEYS

(First Revision)

ICS 65.060.01

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

August 2008

Price Group 3

Pulleys and Belts Sectional Committee, PG 29

NATIONAL FOREWORD

This Indian Standard (First Revision) which is identical with ISO 3410 : 1989 'Agricultural machinery — Endless variable-speed V-belts and groove sections of corresponding pulleys' issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on the recommendation of the Pulleys and Belts Sectional Committee and approval of the Production and General Engineering Division Council.

This standard was originally published in 1978. The first revision has been harmonized with ISO 3410 : 1989 by adoption to make pace with the latest development taken place at International level.

The text of ISO Standard has been approved as suitable for publication as an Indian Standard without deviations. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'.

b) Comma (,) has been used as a decimal marker, while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

In this adopted standard, reference appears to the following International Standard for which Indian Standard also exists. The corresponding Indian Standard which is to be substituted in its respective place is listed below along with its degree of equivalence for the edition indicated:

International Standard	*Corresponding Indian Standard*	*Degree of Equivalence*
ISO 3 : 1973 Preferred numbers — Series of preferred numbers	IS 1076 (Part 1) : 1985 Preferred numbers: Part 1 Series of preferred numbers	Identical

The technical committee responsible for the preparation of this standard has reviewed the provisions of following International Standards referred in this adopted standard and has decided that they are acceptable for use in conjunction with this standard:

International Standard	*Title*
ISO 1081 : 1980[1]	Drives using V-belts and pulleys — Terminology
ISO 9608 : 1988[2]	V-belts — Uniformity of belts — Centre distance variation — Specification and test method

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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[1] Since revised in 1995.

[2] Since revised in 1994.

Indian Standard

AGRICULTURAL MACHINERY — ENDLESS VARIABLE-SPEED V-BELTS AND GROOVE SECTIONS OF CORRESPONDING PULLEYS

(First Revision)

1 Scope

This International Standard specifies the main dimensions of endless variable-speed V-belts intended for use on agricultural machinery (and, in particular, harvester-thresher machines), together with the groove section of the corresponding fixed- or variable-diameter pulleys.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 3 : 1973, *Preferred numbers — Series of preferred numbers.*

ISO 1081 : 1980, *Drives using V-belts and pulleys — Terminology.*

ISO 9608 : 1988, *V-belts — Uniformity of belts — Centre distance variation — Specifications and test method.*

3 Definitions and symbols

For the purposes of this International Standard, the terms and symbols relating to drives using V-belts (i.e. belts and grooved pulleys) defined in ISO 1081 apply.

4 Dimensions and tolerances

4.1 Belts

4.1.1 General

An endless variable-speed V-belt on agricultural machinery transmits a high degree of force per unit of section; when it approaches a groove pulley, its cross-section undergoes appreciable deformations. For this reason, the various dimensions which are defined hereunder are to be taken as being those of the belt placed on the device used for the measurement of its length, and subjected to the force F. The dimensions w_p, B, W and T are those relating to the parts of the belt when in contact with the measuring pulleys.

4.1.2 Cross-sections (see figure 1)

The cross-section is characterized by a "relative height" (relation of height T of sides to pitch width w_p) which, on average, is in the region of 0,5; the pitch line is shown as being at approximately one-third of the height of the profile below the large base of the trapezium. The cross-sectional dimensions are given in table 2.

4.1.3 Lengths

The range of datum lengths is that of the R 40 series of preferred numbers (see ISO 3) from 630 mm to 5 000 mm (see table 3). If intermediate values are required, they shall be taken from the R 80 series of preferred numbers (see ISO 3).

4.1.4 Tolerance on length

The length of the belts is affected by the maximum admissible variations of $^{+p/2}_{-p}$, where p is calculated, with a certain amount of approximation, using the formula

$$p = 0{,}8\sqrt[3]{L} + 0{,}006\,L$$

L being the preferred number from the R 10 series equal to or immediately greater than the datum length, expressed in millimetres.

4.1.5 Centre distance variations

Centre distance variations are given in relation to the belt top width in table 1.

Table 1 — Centre distance variations

Dimensions in millimetres

Belt length		Top width	
over	up to (inclusive)	< 25	> 25
		ΔE	
—	1 000	1,2	1,8
1 000	2 000	1,6	2,2
2 000	5 000	2	3,4
5 000	—	2,5	3,4

4.2 Grooved pulleys

These belts are almost always used with two variable-diameter pulleys (type 2), one of these pulleys possibly allowing for the release of the drive (type 3); more rarely, this type of belt can be made to function jointly with a fixed-diameter pulley (type 1). Table 4 gives, for each of these types, the datum diameter minimum values and radial dimensions of the groove.

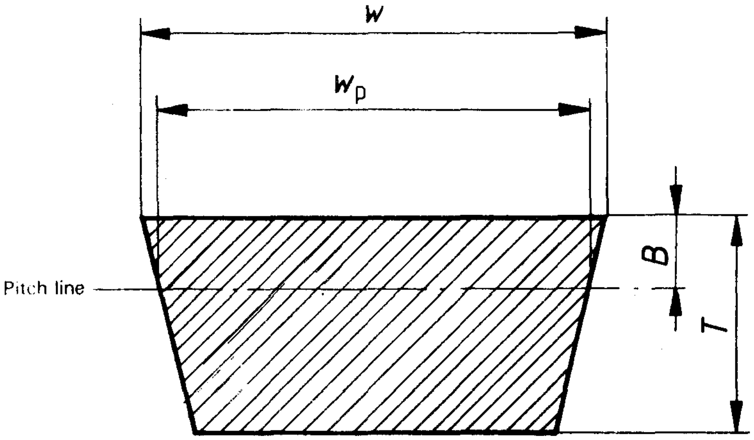


Figure 1 — Cross-section

5 Measuring and checking

5.1 Checking of belts

5.1.1 Measuring device

The device recommended, shown in sketch-form in figure 3, consists essentially of two grooved pulleys of similar functional dimensions, one of which is movable in the same plane as the pulley by force F (table 5).

Rotate the belt to make at least two complete revolutions of the belt, then measure the distance E between centres of the two pulleys.

Table 2 — Cross-sectional dimensions

Dimensions in millimetres

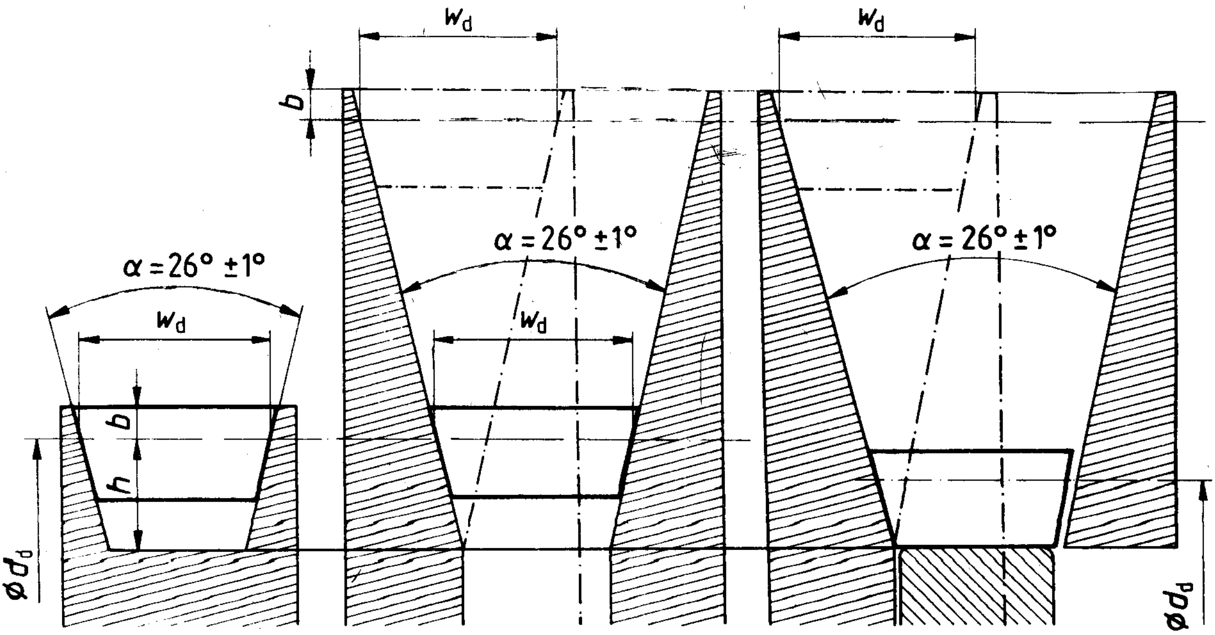
Profile	HG	HH	HI	HJ	HK	HL	HM	HN	HO
w_p	15,4	19	23,6	29,6	35,5	41,4	47,3	53,2	59,1
w nom.	16,5	20,4	25,4	31,8	38,1	44,5	50,8	57,2	63,5
T nom.	8	10	12,7	15,1	17,5	19,8	22,2	23,9	25,4
B[1]	2,5	3	3,8	4,7	5,7	6,6	7,6	8,5	9,5

1) Approximate expression: $B = 0{,}16\ w_p$

Table 3 — Belt lengths

Datum length, L_d			Profile								
nom.	tol. $+p/2$	$-p$	HG	HH	HI	HJ	HK	HL	HM	HN	HO
mm											
630	5	10	×								
670	5	10	×								
710	6	12	×								
750	6	12	×								
800	6	12	×	×							
850	6	12	×	×							
900	7	14	×	×							
950	7	14	×	×							
1 000	7	14	×	×	×						
1 060	8	16	×	×	×						
1 120	8	16	×	×	×						
1 180	8	16		×	×						
1 250	8	16		×	×						
1 320	9	18		×	×						
1 400	9	18		×	×	×					
1 500	9	18		×	×	×					
1 600	9	18		×	×	×	×				
1 700	11	22			×	×	×				
1 800	11	22			×	×	×				
1 900	11	22				×	×				
2 000	11	22				×	×	×	×		
2 120	13	26				×	×	×	×	×	
2 240	13	26				×	×	×	×	×	×
2 360	13	26				×	×	×	×	×	×
2 500	13	26					×	×	×	×	×
2 650	15	30					×	×	×	×	×
2 800	15	30					×	×	×	×	×
3 000	15	30					×	×	×	×	×
3 150	15	30						×	×	×	×
3 350	18	36						×	×	×	×
3 550	18	36						×	×	×	×
3 750	18	36						×	×	×	×
4 000	18	36						×	×	×	×
4 250	22	44							×	×	×
4 500	22	44							×	×	×
4 750	22	44							×	×	×
5 000	22	44							×	×	×

NOTE — Reduced length tolerances may be used in national standards or by agreement between manufacturer and user.



a) Type 1 — Fixed diameter **b) Type 2 — Variable diameter** **c) Type 3 — Variable diameter, allowing drive release**

Figure 2 — Pulleys

Table 4 — Dimensions of pulleys

Dimensions in millimetres

Pulley type	Dimension	Approximate expression	Profile								
			HG	HH	HI	HJ	HK	HL	HM	HN	HO
1-2-3	w_d		15,4	19	23,6	29,6	35,5	41,4	47,3	53,2	59,1
1-2-3	b min.	0,16 w_d	2,5	3	3,8	4,7	5,7	6,6	7,6	8,5	9,5
1-2	d_d min.	3,55 w_d	55	68	84	105	126	147	168	189	210
3		3,15 w_d	49	60	74	93	112	130	149	168	186
1-2	h min.	0,535 w_d	8	10	13	16	19	22	25	28	32
3		$T - B$	5,5	7	8,9	10,4	11,8	13,2	14,6	15,4	15,9

NOTE — The values of d_d min. and h min. have been rounded.

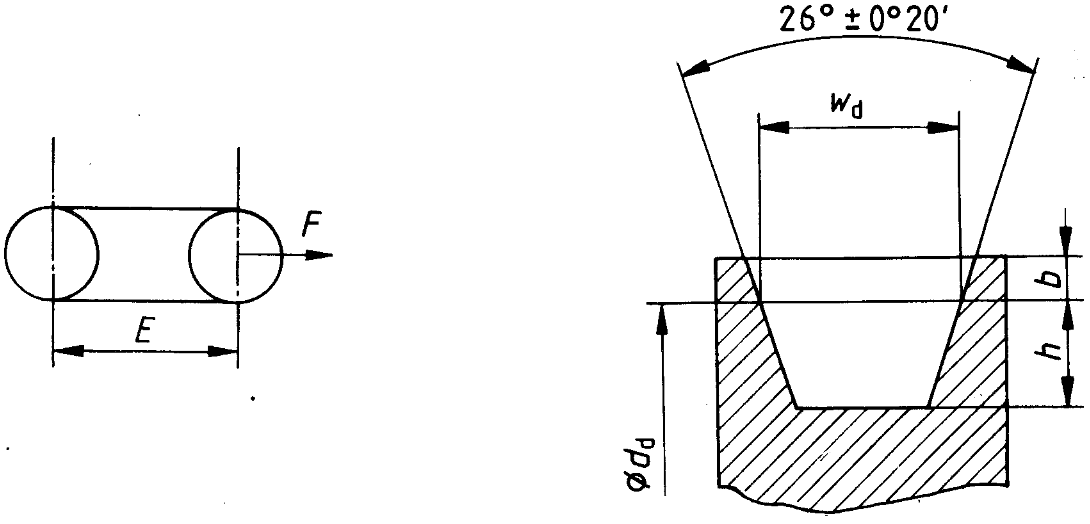


Figure 3 — Measuring device

Table 5 — Dimensions of measuring pulleys, and measuring forces

Dimension		Approximate expression	Profile HG	HH	HI	HJ	HK	HL	HM	HN	HO
w_d	mm		15,4	19	23,6	29,6	35,5	41,4	47,3	53,2	59,1
b	mm	0,16 w_d	2,5	3	3,8	4,7	5,7	6,6	7,6	8,5	9,5
h min.	mm	0,535 w_d	8	10	13	16	19	22	25	28	32
d_d	mm	5,3 w_d*)	95,49 ±0,13	95,49 ±0,13	127,32 ±0,13	159,16 ±0,13	190,99 ±0,13	222,82 ±0,13	254,65 ±0,13	286,48 ±0,13	318,31 ±0,13
C_d	mm	17 w_d*)	300	300	400	500	600	700	800	900	1 000
F	N	1,46 w_d^2**)	350	530	800	1 300	1 800	2 500	3 300	3 300	3 300

*) Except for HG and HH.

**) Except for HN and HO.

NOTE — Belt ride-out shall be between −0,8 mm and + 4,1 mm, except for HN and HO, for which the belt ride-out shall be between −0,8 mm and 5,6 mm.

5.1.2 Checking belt length

The datum length of the belt — i.e. its length measured at the level where its width is equal to the pitch width, w_p — is obtained by the formula

$$L_d = 2E + C_d$$

where

E is the distance between axes, measured in accordance with 5.1.1;

C_d is the datum circumference of the control pulleys (see table 5).

5.1.3 Checking centre distance variation

Centre distance variations shall be checked in accordance with ISO 9608.

5.2 Groove section of measuring pulleys

Only the values w_d, C_d and the angle of the groove are of importance; the radial dimensions b and h as given on the figures and in table 5 are supplied only for information.

5.3 Groove checking of measuring pulleys

5.3.1 Principle

The groove of measuring pulleys can be checked by means of two rods, the diameter d of which is given in table 6. The diameters d have been determined so that the simultaneous contact of each rod with the two sides is made at the level of the datum circumference.

5.3.2 Checking method

Place the two rods in the groove to be checked and put them in contact with the latter, so that their axes are parallel (see figure 4).

Then measure the distance K between the tangent planes to the rods outside of the pulley and parallel to the axis of the latter.

The measured value of K shall be that given in table 6.

Table 6 — Rod diameters and values of K

Dimensions in millimetres

Type	d nom.	tol.[1]	K nom.	tol.
HG	15,805	+ 0,005 − 0,003	114,85	±0,2
HH	19,5	+ 0,005 − 0,004	119,38	
HI	24,221		156,99	
HJ	30,379	+ 0,006 − 0,005	196,37	
HK	36,434		235,62	
HL	42,489		274,87	
HM	48,544		314,11	
HN	54,599	+ 0,006 − 0,007	353,36	
HO	60,655		392,61	

[1] Tolerance j5: see ISO 286-2.

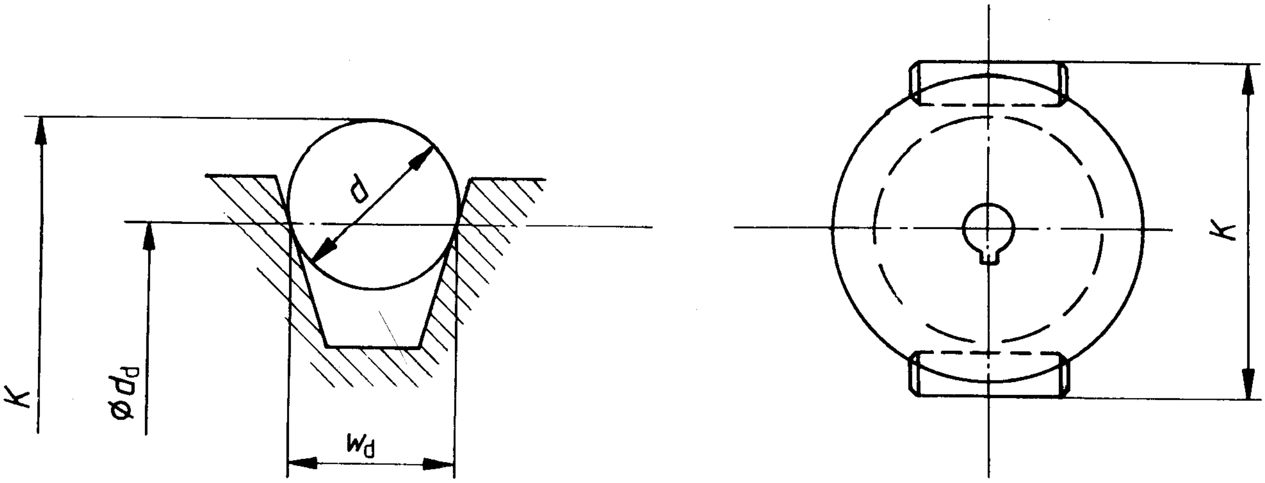


Figure 4 — Checking method for groove diameter

Annex A
(informative)

Bibliography

ISO 286-2 : 1988, *ISO system of limits and fits — Part 2 : Tables of standard tolerance grades and limit deviations for holes and shafts.*

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